

CLAIMS

That which is claimed:

1. A method of modifying bandwidth and/or Quality of Service (QoS) for a user session in a network that comprises a Regional/Access Network (RAN) that facilitates differentiated end-to-end data transport between a Network Service Provider (NSP) and/or an Application Service Provider (ASP) and a Customer Premises Network (CPN) that includes Customer Premises Equipment (CPE),
5 comprising:
receiving a request at the NSP and/or the ASP to change bandwidth and/or QoS associated with the user's session; and
using Application Programming Interface (API) calls at the NSP and/or the
10 ASP to communicate with the RAN to modify the bandwidth and/or QoS associated with the user's session.
2. The method of Claim 1, wherein receiving the request comprises:
initiating the request at the NSP and/or the ASP to change the bandwidth
15 and/or QoS associated with the user's session.
3. The method of Claim 1, wherein receiving the request comprises:
receiving the request at the NSP and/or the ASP from a user to change the
bandwidth and/or QoS associated with the user's session
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4. The method of Claim 3, wherein the QoS associated with the user's session is scheduling resources.
5. The method of Claim 4, wherein using the API comprises:
25 sending a query from the NSP and/or the ASP to the RAN to obtain a bandwidth range and/or QoS capabilities from the RAN.
6. The method of Claim 5, further comprising:
presenting to the user via the ASP and/or the NSP at least one bandwidth/QoS
30 option within the bandwidth range and/or QoS capabilities received from the RAN.

7. The method of Claim 6, further comprising:
obtaining a user selection of one of the at least one bandwidth/QoS option at
the NSP and/or the ASP; and
updating the RAN with information to provide the selected bandwidth/QoS
5 option for the user's session.

8. The method of Claim 7, further comprising:
updating the CPE with the information to provide the selected bandwidth/QoS
option for the user's session.

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9. The method of Claim 8, wherein updating the CPE with information
comprises:
sending an update session bandwidth info message and/or a QoS-related
message from the RAN to the CPE that contains a request for changing the
15 bandwidth/QoS associated with the user's session to the selected bandwidth option in
the CPE.

10. The method of Claim 9, wherein updating the RAN with information
further comprises:
20 updating a rate limit and/or QoS associated with a communication queue in the
RAN that is used to process traffic associated with the user's session.

11. The method of Claim 7, wherein updating the RAN with information
comprises:
25 sending a change session bandwidth request message from the NSP and/or the
ASP to the RAN that contains a request for changing the bandwidth associated with
the user's access session to the selected bandwidth option in the RAN.

12. The method of Claim 11, further comprising:
30 sending a change session bandwidth response message from the RAN to the
NSP and/or the ASP that contains an acknowledgement for the change session
bandwidth request message.

13. The method of Claim 11, wherein updating the RAN with information further comprises:

updating a rate limit associated with a communication queue in the RAN that is used to process traffic associated with the user's session.

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14. The method of Claim 5, further comprising:

authenticating the NSP and/or the ASP with the RAN prior to sending the query from the NSP and/or the ASP to the RAN.

10 15. The method of Claim 14, wherein authenticating the NSP and/or the ASP with the RAN comprises:

sending an establish service session request message from the NSP and/or the ASP to the RAN that contains an identification of the NSP and/or the ASP and authorization credentials; and

15 sending an establish service session response message from the RAN to the NSP and/or the ASP that contains an authentication result.

16. The method of Claim 5, wherein sending the query comprises:

20 sending a query session bandwidth request message from the NSP and/or the ASP to the RAN that contains a request for bandwidth information associated with the user's session; and

sending a query session bandwidth response message including scheduling resources from the RAN to the NSP and/or the ASP that contains the bandwidth range.

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17. The method of Claim 1, wherein the request is a first request, the method further comprising:

updating the RAN and the CPE with information to modify the bandwidth and/or QoS associated with the user's session; then

30 receiving a second request at the NSP and/or the ASP to delete or change bandwidth and/or QoS associated with the user's session; and

using API calls at the NSP and/or the ASP to communicate with the RAN to change the bandwidth and/or QoS associated with the user's session to a default value in the RAN.

18. The method of Claim 1, wherein the RAN comprises a Broadband Remote Access Server (BRAS).

5 19 A system for modifying bandwidth and/or Quality of Service (QoS) for
a user session in a network that comprises a Regional/Access Network (RAN) that
facilitates differentiated end-to-end data transport between a Network Service
Provider (NSP) and/or an Application Service Provider (ASP) and a Customer
Premises Network (CPN) that includes Customer Premises Equipment (CPE),
10 comprising:
 means for receiving a request at the NSP and/or the ASP to change bandwidth
and/or QoS associated with the user's session; and
 means for using Application Programming Interface (API) calls at the NSP
and/or the ASP to communicate with the RAN to modify the bandwidth and/or QoS
15 associated with the user's session.

 20. The system of Claim 19, wherein the means for receiving the request
comprises:
 means for initiating the request at the NSP and/or the ASP to change the
20 bandwidth and/or QoS associated with the user's session.

 21. The system of Claim 19, wherein the means for receiving the request
comprises:
 means for receiving the request at the NSP and/or the ASP from a user to
25 change the bandwidth and/or QoS associated with the user's session

 22. The system of Claim 21, wherein the QoS associated with the user's
session is scheduling resources.

30 23. The system of Claim 22, wherein the means for using the API
comprises:
 means for sending a query from the NSP and/or the ASP to the RAN to obtain
a bandwidth range and/or QoS capabilities from the RAN.

24. The system of Claim 23, further comprising:
means for presenting to the user via the ASP and/or the NSP at least one
bandwidth/QoS option within the bandwidth range and/or QoS capabilities received
from the RAN.

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25. The system of Claim 24, further comprising:
means for obtaining a user selection of one of the at least one bandwidth/QoS
option at the NSP and/or the ASP; and
means for updating the RAN with information to provide the selected
bandwidth/QoS option for the user's session.

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26. The system of Claim 25, further comprising:
means for updating the CPE with the information to provide the selected
bandwidth/QoS option for the user's session.

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27. The system of Claim 26, wherein the means for updating the CPE with
information comprises:
means for sending an update session bandwidth info message and/or a QoS
related message from the RAN to the CPE that contains a request for changing the
bandwidth/QoS associated with the user's session to the selected bandwidth option in
the CPE.

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28. The system of Claim 27, wherein the means for updating the RAN
with information further comprises:

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means for updating a rate limit and/or QoS associated with a communication
queue in the RAN that is used to process traffic associated with the user's session.

29. The system of Claim 25, wherein the means for updating the RAN
with information comprises:

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means for sending a change session bandwidth request message from the NSP
and/or the ASP to the RAN that contains a request for changing the bandwidth
associated with the user's access session to the selected bandwidth option in the RAN.

30. The system of Claim 29, further comprising:

means for sending a change session bandwidth response message from the RAN to the NSP and/or the ASP that contains an acknowledgement for the change session bandwidth request message.

5 31. The system of Claim 29, wherein the means for updating the RAN with information further comprises:

means for updating a rate limit associated with a communication queue in the RAN that is used to process traffic associated with the user's session.

10 32. The system of Claim 23, further comprising:

means for authenticating the NSP and/or the ASP with the RAN prior to sending the query from the NSP and/or the ASP to the RAN.

15 33. The system of Claim 32, wherein the means for authenticating the NSP and/or the ASP with the RAN comprises:

means for sending an establish service session request message from the NSP and/or the ASP to the RAN that contains an identification of the NSP and/or the ASP and authorization credentials; and

20 means for sending an establish service session response message from the RAN to the NSP and/or the ASP that contains an authentication result.

34. The system of Claim 23, wherein the means for sending the query comprises:

25 means for sending a query session bandwidth request message from the NSP and/or the ASP to the RAN that contains a request for bandwidth information associated with the user's session; and

30 means for sending a query session bandwidth response message including scheduling resources from the RAN to the NSP and/or the ASP that contains the bandwidth range.

35. The system of Claim 19, wherein the request is a first request, the system further comprising:

means for updating the RAN and the CPE with information to modify the bandwidth and/or QoS associated with the user's session;

means for receiving a second request at the NSP and/or the ASP to delete or change a bandwidth and/or QoS associated with the user's session after updating the RAN and the CPE with information; and

5 means for using API calls at the NSP and/or the ASP to communicate with the RAN to change the bandwidth and/or QoS associated with the user's session to a default value in the RAN.

10 36. The system of Claim 19, wherein the RAN comprises a Broadband Remote Access Server (BRAS).

37. A computer program product for modifying bandwidth and/or Quality of Service (QoS) for a user session in a network that comprises a Regional/Access Network (RAN) that facilitates differentiated end-to-end data transport between a Network Service Provider (NSP) and/or an Application Service Provider (ASP) and a
15 Customer Premises Network (CPN) that includes Customer Premises Equipment (CPE), comprising:

a computer readable storage medium having computer readable program code embodied therein, the computer readable program code comprising:

20 computer readable program code configured to receive a request at the NSP and/or the ASP to change bandwidth and/or QoS associated with the user's session; and

computer readable program code configured to use Application Programming Interface (API) calls at the NSP and/or the ASP to communicate with the RAN to modify the bandwidth and/or QoS associated with the user's session.
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38. The computer program product of Claim 37, wherein the computer readable program code configured to receive the request comprises:

computer readable program code configured to initiate the request at the NSP and/or the ASP to change the bandwidth and/or QoS associated with the user's
30 session.

39. The computer program product of Claim 37, wherein the computer readable program code configured to receive the request comprises:

computer readable program code configured to receive the request at the NSP and/or the ASP from a user to change the bandwidth and/or QoS associated with the user's session

5 40. The computer program product of Claim 39, wherein the QoS associated with the user's session is scheduling resources.

 41. The computer program product of Claim 40, wherein the computer readable program code configured to use the API comprises:

10 computer readable program code configured to send a query from the NSP and/or the ASP to the RAN to obtain a bandwidth range and/or QoS capabilities from the RAN.

 42. The computer program product of Claim 41, further comprising:

15 computer readable program code configured to present to the user via the ASP and/or the NSP at least one bandwidth/QoS option within the bandwidth range and/or QoS capabilities received from the RAN.

 43. The computer program product of Claim 42, further comprising:

20 computer readable program code configured to obtain a user selection of one of the at least one bandwidth/QoS option at the NSP and/or the ASP; and
 computer readable program code configured to update the RAN with information to provide the selected bandwidth/QoS option for the user's session.

 44. The computer program product of Claim 43, further comprising:

25 computer readable program code configured to update the CPE with the information to provide the selected bandwidth/QoS option for the user's session.

 45. The computer program product of Claim 44, wherein the computer

30 readable program code configured to update the CPE with information comprises:

 computer readable program code configured to send an update session bandwidth info message and/or a QoS-related message from the RAN to the CPE that contains a request for changing the bandwidth/QoS associated with the user's session to the selected bandwidth option in the CPE.

46. The computer program product of Claim 45, wherein the computer readable program code configured to update the RAN with information further comprises:

5 computer readable program code configured to update a rate limit and/or QoS associated with a communication queue in the RAN that is used to process traffic associated with the user's session.

47. The computer program product of Claim 43, wherein the computer
10 readable program code configured to update the RAN with information comprises:

computer readable program code configured to send a change session bandwidth request message from the NSP and/or the ASP to the RAN that contains a request for changing the bandwidth associated with the user's access session to the selected bandwidth option in the RAN.

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48. The computer program product of Claim 47, further comprising:
computer readable program code configured to send a change session bandwidth response message from the RAN to the NSP and/or the ASP that contains an acknowledgement for the change session bandwidth request message.

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49. The computer program product of Claim 47, wherein the computer readable program code configured to update the RAN with information further comprises:

25 computer readable program code configured to update a rate limit associated with a communication queue in the RAN that is used to process traffic associated with the user's session.

50. The computer program product of Claim 41, further comprising:
computer readable program code configured to authenticate the NSP and/or
30 the ASP with the RAN prior to sending the query from the NSP and/or the ASP to the RAN.

51. The computer program product of Claim 50, wherein the computer readable program code configured to authenticate the NSP and/or the ASP with the RAN comprises:

- 5 computer readable program code configured to send an establish service session request message from the NSP and/or the ASP to the RAN that contains an identification of the NSP and/or the ASP and authorization credentials; and
- computer readable program code configured to send an establish service session response message from the RAN to the NSP and/or the ASP that contains an authentication result.

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52. The computer program product of Claim 41, wherein the computer readable program code configured to send the query comprises:

- 15 computer readable program code configured to send a query session bandwidth request message from the NSP and/or the ASP to the RAN that contains a request for bandwidth information associated with the user's session; and
- computer readable program code configured to send a query session bandwidth response message including scheduling resources from the RAN to the NSP and/or the ASP that contains the bandwidth range.

20 53. The computer program product of Claim 37, wherein the request is a first request, the computer program product further comprising:

- computer readable program code configured to update the RAN and the CPE with information to modify the bandwidth and/or QoS associated with the user's session;
- 25 computer readable program code configured to receive a second request at the NSP and/or the ASP to delete or change bandwidth and/or QoS associated with the user's session after updating the RAN and the CPE with information; and
- computer readable program code configured to use API calls at the NSP and/or the ASP to communicate with the RAN to change the bandwidth and/or QoS
- 30 associated with the user's session to a default value in the RAN.

54. The computer program product of Claim 37, wherein the RAN comprises a Broadband Remote Access Server (BRAS).

55. A method of modifying bandwidth and/or Quality of Service (QoS) for a user session in a network that comprises a Regional/Access Network (RAN) that facilitates differentiated end-to-end data transport between a Network Service Provider (NSP) and/or an Application Service Provider (ASP) and a Customer Premises Network (CPN) that includes Customer Premises Equipment (CPE),
- 5 comprising:
- receiving a request at the NSP and/or the ASP to change bandwidth and/or QoS associated with the user's session; and
- using messaging interface calls at the NSP and/or the ASP to communicate
- 10 with the RAN to modify the bandwidth and/or QoS associated with the user's session.